

WHAT IS CLAIMED IS:

1. A data transfer unit used in a clock swapping system including a transmitter to send data synchronously with a first clock and a receiver to receive data synchronously with a second clock different from the first clock, the transmitter being supplied with a transmission permit signal, and sending, in response to the received transmission permit signal, a transmission enable signal indicating that the data is valid while sending the data synchronously with the transmission enable signal, and the receiver being supplied with a reception permit signal, and sending, in response to the reception permit signal, a reception enable signal indicating that the data is valid while receiving the data synchronously with the reception enable signal, the data transfer unit comprising:

a data latching means for latching the data sent from the transmitter in time with the reception enable signal and from which latched data is read by the receiver in time with the reception enable signal;

a first latching means for latching the transmission enable signal sent from the transmitter in time with the first clock and delaying the latched transmission enable signal for at least one period of the first clock;

a second latching means for latching the transmission enable signal latched by the first latching means in time with the second clock;

a reception permit signal generating means for sending a reception permit signal synchronous with the second clock in response to the transmission enable signal

latched by the second latching means and suspending sending of the reception permit signal in response to the reception enable signal sent from the receiver;

a third latching means for latching the reception enable signal sent from the receiver in time with the second clock and delaying the latched reception enable signal for at least a period of the second clock;

a fourth latching means for latching the reception enable signal latched by the third latching means in time with the first clock; and

a transmission permit signal generating means for sending a transmission permit signal synchronous with the first clock in response to the reception enable signal latched by the fourth latching means and suspending sending of the transmission permit signal in response to the transmission enable signal sent from the transmitter.

2. The apparatus as set forth in claim 1, wherein the second latching means latches the transmission enable signal latched by the first latching means a series of two or more times in time with the second clock; and

the fourth latching means latches the transmission enable signal latched by the second latching means a series of two or more times in time with the first clock.

3. A data transfer method used in a clock swapping method including a transmission step of sending data synchronously with a first clock and a reception step of receiving data synchronously with a second clock different from the first clock; in the transmission step, there being supplied a transmission permit signal and sent signal, in response to the received transmission permit signal, a transmission enable

signal indicating that the data is valid while there is sent the data synchronously with the transmission enable; and in the reception step, there being supplied a reception permit signal, and sent signal, in response to the reception permit signal, a reception enable signal indicating that the data is valid while there is received the data synchronously with the reception enable, the data transfer method comprising:

- a data latching step of latching the data sent from the transmission step in time with the reception enable signal and in which latched data is read in the reception step in time with the reception enable signal;

- a first latching step of latching the transmission enable signal sent from the transmission step in time with the first clock and delaying the latched transmission enable signal for at least one period of the first clock;

- a second latching step of latching the transmission enable signal latched in the first latching step in time with the second clock;

- a reception permit signal generating step of sending a reception permit signal synchronous with the second clock in response to the transmission enable signal latched in the second latching step and suspending sending of the reception permit signal in response to the reception enable signal sent from the reception step;

- a third latching step of latching the reception enable signal sent from the reception step in time with the second clock and delaying the latched reception enable signal for at least a period of the second clock;

- a fourth latching step of latching the reception enable signal latched in the third

latching step in time with the first clock; and

a transmission permit signal generating step of sending a transmission permit signal synchronous with the first clock in response to the reception enable signal latched in the fourth latching step and suspending sending of the transmission permit signal in response to the transmission enable signal sent from the transmission step.

4. The method as set forth in claim 3, wherein the transmission enable signal latched in the first latching step is latched a series of two or more times in the second latching step in time with the second clock; and

the transmission enable signal latched in the second latching step is latched a series of two or more times in the fourth latching step in time with the first clock.